

**IMPROVING LINKS BETWEEN SCIENCE
AND COASTAL MANAGEMENT:
A SURVEY TO ASSESS SCIENCE
AND TECHNOLOGY NEEDS
~ GULF OF MAINE ~**

For

The Gulf of Maine Association

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May, 2004

The University of New Hampshire

Survey Center

The UNH Survey Center is an independent, non-partisan academic survey research organization and a division of the UNH Institute for Policy and Social Science Research.

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**Improving Links Between Science and Coastal Management:
A Survey to Assess Science and Technology Needs
~ Gulf of Maine ~**

University of New Hampshire Survey Center

Methodology

“Improving Links Between Science and Coastal Management: A Survey to Assess Science and Technology Needs” was conducted for the Gulf of Maine Association by the University of New Hampshire Survey Center in Spring 2004. The survey sponsor is the Gulf of Maine Association and it is based upon a previous survey conducted by UNH for the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) in Winter 2003/2004.

Organizations participating in this survey are the Coastal States Organization, National Estuarine Research Reserve System, National Estuary Program, Association of State Floodplain Managers, Association of State Wetland Managers, Association of State and Interstate Water Pollution Control Administrators, and the Interstate Fishery Management Commissions. The survey was designed to:

- help the Gulf of Maine Association and other science organizations strategically plan future funding programs and select projects.
- Assist Congress in understanding the issues and in shaping policy responses including program funding and reauthorization.
- Providing a current understanding of coastal management needs in a rapidly changing information environment so that federal agency technical assistance efforts can be more targeted more effectively.
- Enhancing researchers ability to share, learn and leverage resources across multiple coastal and estuarine management programs.

The survey was conducted as a web survey. Potential participants were identified by the Gulf of Maine Association and respondents were e-mailed information about the survey and a link to a web site where they could complete the survey. Information from thirty-eight (38) respondents from Maine, New Hampshire and Massachusetts gathered in the previous CICEET study was included along with twenty-five (25) responses from Nova Scotia and New Brunswick, Canada. Sixty-three (63) respondents in total completed the survey.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Responses to open-ended questions were presented verbatim.

VERBATIM RESPONSES

Question 1a – Other

- Offshore cobble habitats
- Subtidal seafloor habitat
- Estuaries, embayments
- Nearshore ocean floor
- Intertidal mudflats
- Nearshore waters
- Sea bed under aquaculture cages
- Rocky reefs
- Offshore fishing grounds
- Offshore habitats - canyons, banks...
- Riparian edges

Question 1b – Other

- Identify impacts from different types of activities
- Identify and map habitats
- Impacts from Coastal Development
- Identify changes and the physical factors causing those changes
- Determine remedial methodology
- Especially 'provide ecological characterization'
- Secure funding in habitat restoration

Question 1c – Other

- Ethnographic studies
- Brainstorming methodologies and investigating innovative techniques
- Contaminant trend

Question 1d – Other

- Eelgrass distribution
- Invasive species
- Underwater imagery
- Associated vegetation & invasives
- Updated mapping of habitats and land cover
- Lidar/shoals/topographic beach data
- Shoreline position
- Building permits / development / river water quality / land use changes
- Biotic trends
- Invasive species
- Total organic carbon (sediment particles); toxicity of particles; chlorophyll (total); a number of trace chemicals (metals and organics)
- Contaminants (e.g. Mercury)
- Species richness, invasive species
- Benthic species
- Population demographics/resource use characteristics
- Contaminant

- Land use maps

Question 1e – Other

- Rigorous habitat/ecological assessment and evaluation technology
- Cash
- Regular interval rectified orthophotographs
- Molecular diagnostic biomarkers
- Long-term monitoring benthos

Question 2a – Other

- Affordable housing laws
- Regulatory compliance and deterrence
- Education of coastal landowners on coastal hazards they face
- Coastal flooding
- On the ground watershed restoration/conservation

Question 2b – Other

- Quantify impact of land use on marine habitats

- Implement programs that actually realize improvements to the landscape

Question 2c – Other

- Percent of impermeable surface in watersheds
- Location, age, and state of on-site wastewater systems
- Model ordinances and planning assistance for communities
- Ethnographic/historical studies

Question 2d – Other

- SAV coverage
- Encroachments (on wetlands, public lands)
- Nutrients
- USGS River Flow
- Vegetation
- Updated land use/land cover
- Beach characteristics, storm impacts (i.e., 100 yr storm)
- Surface currents
- River water quality, riparian land use changes, building permits / development
- Development patterns & impervious surface coverage
- Invasive species
- Benthos

- Monitor improvements as a result of implementing on the ground programs

Question 2e – Other

No Other response

Question 3a – Other

- Groundwater; residential runoff; coastal watershed development
- Seafood processing plant effluents

Question 3b – Other

- Development of loading rates/thresholds
- Nutrient loading

Question 3c – Other

- Location, state, and age of on-site systems
- Baseline data

Question 3d – Other

- Detailed nitrogen chemistry
- Nutrients
- River and estuarine water quality
- Contaminants (e.g. Mercury)
- Macroinvertebrate assessments
- Long term monitoring of the impact of on-the -ground projects

Question 3e – Other

- Protect open space

Question 4a – Other

- The unknown
- Mill effluent and air-borne discharge
- Wastes from aquaculture
- Heavy metals
- Overland run off

Question 4b – Other

- There needs to be a rigorous analytical assessment of methods and assumptions for conducting bacterial source tracking

Question 4c – Other

- Trend data
- Bioaccumulation pathways

Question 4d – Other

- DNA analyses for determining sources of bacteria
- Modeling of fate and effects
- Areas vulnerable to oil spills
- Stormwater water quality, River / Estuarine water quality
- MeHg, PAH's, Biocides
- Contaminants (e.g. Mercury)
- Benthos, demersal fish
- Long term monitoring of environmental impact of on the ground projects

Question 4e – Other

- Oil spill cleanup technology

Question 5a – Other

- Baseline assessment of presence

Question 5b – Other

- Associated impacts of invasive control

Question 5c – Other

- Economic impacts
- Invasive control measure effects
- Correct taxonomic identification of the species being introduced

Question 5d – Other

- Biological inventories
- Baseline info pre and post invasive control
- Man-made surfaces (e.g. docks, piers, pipes); invasives monitoring

- Vegetation
- Vegetation mapping
- Benthic species
- Changes in benthic species assemblages
- Long term population monitoring

Question 5e – Other

- Distribution of benthic species

Question 6a – Other

- Development in high hazard areas

Question 6b – Other

- Assessment of ecological impacts of shoreline stabilization/sediment mining
- Coastal dune mapping using LIDAR data
- Marketing research -- what would sell people on hazard mitigation?

Question 6c – Other

- Properly mapped velocity zones

Question 6d – Other

- Storm characteristics/beach response
- Shoreline position

Question 6e – Other

- Shoreline change analysis approaches

Question 7a – Other

- Offshore sand mining
- Sediments (fines) Loading Stormwater BMPs - Infiltration Facilities
- Implementation of on-the-ground projects that reduce/prevent unnatural erosion

Question 7b – Other

- Impacts of Sand mining on Fisheries Habitat in the Northeast

- Contaminant

Question 7c – Other

- Planning tools and effective public outreach strategies
- Recovery rates of disturbed habitats
- Effectiveness of storm water BMP treatment/containment of sediments, including Low Impact Design techniques.

Question 7d – Other

- Storms, beach characteristics
- Shoreline position
- Contaminants (e.g. Mercury)
- Long term monitoring of the impact of on the ground projects designed at reducing erosion

Question 7e – Other

No other response

Question 8a – Other

- Ecologically based management planning
- Proper management of development in coastal areas to protect estuaries
- Management of offshore sand resources
- Water level / currents forecasting

Question 8b – Other

- Benthic habitat mapping

Question 8c – Other

- Baseline ecological information
- Information at a finer spatial and temporal scale
- More bathymetric data
- Understanding human values
- Ethnographic studies

Question 8d – Other

- Eelgrass distribution and loss
- Aerial/satellite imagery at a finer scale for both time and space

- Social & economic
- Water and water column uses
- This is not relevant to the question
- Contaminants (e.g. Mercury)
- Benthic species assemblages, species richness

Question 8e – Other

- Multidimensional GIS
- Links between land use and coastal degradation
- Long-term water quality monitoring
- Drone technology for monitoring uses
- Public participation in marine issues
- BMPs for fishing industry (all sectors)

Question 9a – Other

- Debris impact on existing coastal structure during storm events

Question 9b – Other

No other response.

Question 9c – Other

- Industry/activities inventory

Question 9d – Other

- Persistent litter on beaches

Question 9e – Other

No other response

Question 10 – Other comments

- The marine section of the survey did not, in my opinion, focus enough on the involvement of people in decision making in the marine environment.
- In terms of coastal issues and management, the survey did not include a consideration of the needs and applications of coastal EEM (environmental effects monitoring), coastal/marine ecotoxicology (fate and effects of chem...
- Impacts and adaptation of rising sea level and climate change. Unified 3D shoreline management (i.e. Physical land / sea boundaries) using the latest technical advances
- In general, need for more ethnographic and historical research to understand human-environment interactions.
- Although referred to in one of the questions, the impact of contaminants such as mercury and other heavy metals is a major issue in the Gulf of Maine and its northerly extension, the Bay of Fundy. Some work is ongoing in
- Cumulative uses/activities overlapping in same areas (the cumulative impact isn't always known)
- Sustainable aquaculture practices such as integrated multitrophic aquaculture

- Wastes from shipping. Environmental effects of fishing activity by type. Effects of recreational activities such as power boats, whale watching etc. New suite of chemicals entering our waste waters.
- Improved habitat characterizations, especially for benthic/substrate, would be an asset for our work.
- In all coastal systems, attention must be given to the source of problems being mainly land use by humans (in freshwater).
- We are implementing an Applied Coastal Ecosystem Science (ACES) multidisciplinary framework for addressing major issues in
- I would have liked to have seen something about the potential for ngos in addressing the issues listed.
- There is no such thing as no-impact aquaculture, you could suggest low-impact aquaculture, but also add such things as low
- Many critical overarching long range policy decisions have not been made in key areas so most of the issues above are not fully resolvable in the current "fire containment" mode we currently operate in.
- More information is needed on the factors affecting the spatial and temporal settlement of juvenile pelagic fishes and their successful development; as well as identifying what are the critical environmental characteristics of these nursery habitats.
- Development of a comprehensive research and monitoring plan, Funding to implement comprehensive research and monitoring, Methods, including new technology, to conduct comprehensive research and monitoring, Dredged material
- There is a need for regional data on the potential thermal effects on fish and invertebrate physiology and life history resulting from heated industrial discharges (e.g., power plants). Some species of interest that immediately come to mind are win
- On the subject of sea-level rise there needs to be a geographically wide (perhaps global) and frequent reanalysis and monitoring of trends to see if there is an acceleration due to climate change and global warming.
- Monitoring of coastal waters by State environmental agencies should be increased

DETAILED TABULAR RESPONSES